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MEETING NOTES

TO: Distribution

DATE: January 25, 1994

FROM: Philip Nixon

MEMO #: SP307:013194:01

PROJECT #: Solar Pond IM/IRA

ATTENDANCE:

Harlen Ainscough, CDH
Phil Nixon, ES
Richard Henry, ES
Andy Ledford, EG&G
Dave Ericson, EG&G
Scott Surovchak, DOE
Peg Witherill, DOE
Ted Kearns, DOE/KMI
Steve Paris, EG&G
Lee Pivonka, G&M
Mark Austin, EG&G
John Haasbeek, ERM

DISTRIBUTION:

Attendees
L. Benson, ES
A. Conklin, ES
P. Breen, ES
H. Heidkamp, ES
K. Cutter, ES
S. Stenseng, ES
A. Fricke, ES
T. Kuykendall, ES
T. Evans, ES
B. Cropper, ES
C. Montes, ES
R. McConn, ES
W. Edmonson, ES
B. Wallace EG&G (Admin. Record) (2)
K. London, EG&G
Martin McBride, DOE
Helen Belencan, DOE
Steve Cooke, EG&G
Joe Schieffelin, CDH
Bob Segris, LATO
Steve Keith, EG&G
Dave Myers, ES
R. Wilkinson, ES
S. Winston, ES
Frazer Lockhart, DOE
Kim Ruger, EG&G
Michelle McKee, EG&G
Marcia Dibiasi, IGO
Steve Howard, DOE/SMS
Rich Stegen, ES
Cindy Gee, ES
Randy Ogg, EG&G
Randy MacGregor, ERM

1) Meeting Minutes Comments/Issue Resolution

The meeting minutes from the January 18, 1994 team meeting will be re-issued to specify corrections and modify some of the discussions concerning the engineered cover re-evaluation and the VLEACH modeling. Specific modifications will include:

- Incorporating the "historical" water table elevations into the vadose zone definition.
- Modify the discussion on the impacts of having 2 different engineered cover types.
- Specify that new PRGs may have to be developed for a different exposure scenario if promulgated standards do not exist for COCs that are modeled by VLEACH.
- Modify the request for CDH review of the subsurface drainage layer to request their review of the concept to consolidate contaminated media beneath the subsurface drainage layer.

Arturo Duran stated that DOE should consider excavating soils within the zone from the actual water table elevation to the historical high water table elevation if PRG concentrations are exceeded. This would maximize the removal of the source of contamination and reduce the potential for additional ground water impacts which may require remediation. It was agreed that DOE would meet the requirements for clean closure if all media with constituent of concern (COC) concentrations exceeding PRGs were removed down to the level of the historical high water table elevation. However, DOE may perform an economic evaluation to determine if additional media should be excavated. It was agreed that the results of DOE's economic evaluation would be used internally by DOE in deciding whether to remove contaminated soils which are located below the historical high water table elevation. It was also agreed that the IM/IRA required clean-closure demonstration would only include soils above the historical high water table elevation.

It was agreed that the vadose zone was defined as the unsaturated zone from the ground surface to the historical high water table elevation. The historical period of water table elevation measurement extends from 1986 to 1993. All available valid data will be used to assess the historical high water table elevation. A topographic map showing the historical high water table elevations will be prepared and included in the IM/IRA decision document. It was discussed that the inclusion of the subsurface drainage layer was a conservative measure to prevent ground water from contacting consolidated liners.

Harlen Ainscough specified that CDH would be comfortable with the concept of consolidating contaminated media at concentrations exceeding PRGs beneath the subsurface drainage layer [redacted] dependent upon VLEACH modeling results indicating

that contaminants would not leach at concentrations that would adversely impact ground water. Therefore, contaminated media can be used as material to construct the artificial vadose zone.

2) IM/IRA Package Overview

Phil Nixon discussed the upcoming roundtable review draft of the IM/IRA-decision document. Written comments will be preferred in that they can be addressed more effectively than oral comments. ES will provide a comment/response form with the document to aid the reviewer. Comments should be written on the form, and submitted to ES/ERM/G&M on the day that the specific Part is discussed. Comments on Part V should be separate so that they can be forwarded to ERM/G&M. Reviewers may mark-up text pages and submit them to ES (attached to the comment sheets) if a response to the comment is not needed. This is intended for minor comments. The meeting forum should be reserved for discussing controversial comments or comments that may have a substantial impact on the project.

ES will put line numbers in the right hand margin so that it is easy for commentators to specify the location of a comment. The document will be single spaced to conserve paper.

It was agreed that ES would include only the appendices that were important to have as reference materials during the review. Appendices will be made available to any reviewer who requests a copy to substantiate the review.

3) Status of Building 788.

Ted Kearns reported that DOE is still considering the administrative process for documenting the removal of Building 788. It was agreed that a decision needs to be made quickly.

The issues surrounding the decision concern NEPA compliance and a schedule for removal. The removal of Building 788 may be a component of the IM/IRA with respect to NEPA so that the issue of project segmentation does not jeopardize the issuance of a FONSI. However, if the Building 788 removal is included within the OU4 IM/IRA, then the removal cannot commence until the IM/IRA is approved (January 1995). Therefore the goal to remove the building by late fall 1994 could not be realized.

A categorical exclusion from NEPA might be granted if any use for the building could be found that does not involve hazardous/mixed waste storage or processing.

ES indicated that the removal of Building 788 could be incorporated into the IM/IRA by the first IAG milestone if the decision was made soon.

Harlen Ainscough requested that the decision be made by the next team meeting. EG&G will send a letter to DOE requesting guidance on the issue, and requesting that DOE prepare a letter specifying that the goal to have Building 788 removed by September 30, 1994 be changed if the activity were put back into the scope of the OU4 IM/IRA.

4) Comments on the Annotated Post-Closure Monitoring Plan and Design Criteria.

Lee Pivonka specified that some comments had been received form EG&G and ES. CDH and EPA committed to finishing the review by Friday, January 28, 1994. Lee Pivonka indicated that ERM/G&M were moving forward as stated in the plans. The team acknowledged that this was necessary due to the current schedule constraints.

5) Commencement of Field Activities Prior to Final IM/IRA-dd Approval.

Andy Ledford indicated that EG&G was interested in expediting construction to beat the IAG dispute resolution commitment dates. He asked if CDH would grant conditional approval to being site work activities after receipt of public comments but prior to final CDH approval.

Harlen Ainscough specified that formal SEP closure activities could not commence until 10 days after formal CDH approval of the IM/IRA. However, certain activities that were not considered "closure/remediation" activities may be completed prior to final approval. These activities should be specified in the IM/IRA as items that are appropriate for early completion. Candidate activities include:

1) installation of a new security fence, and
2) relocation of utilities.

ES and EG&G will investigate other activities that need to commence early.

6) Concurrence of Design Criteria

Mark Austin asked for confirmation that the Building 788 foundation and other concrete debris could be rubbleized and consolidated under the engineered cover. The team agreed with this concept.

Mark Austin specified that EG&G was going to survey the boundaries of OU4 to identify the boundaries where OU4 was responsible for remediation. Mark indicated that OU4 would not remediate soils outside the OU4 boundary. Arturo Duran specified that if contamination exists outside but adjacent to the OU4 study area, then DOE should consider excavating the soil to prevent it from being a contaminant source to ground water. Harlen Ainscough stated that additional soil sampling and potential remediation could be required in the Phase II program based on the results of the Phase I RFI/RI.

It was agreed that the OU4 IM/IRA was only required to address contamination within the OU4 boundaries. however, DOE may consider the cost benefit from remediating adjacent areas (if required). **It was agreed that DOE would only remediate a quantity of soils from outside the OU4 boundaries that could be consolidated into a covered area of reasonable size based upon the physical site constraints at OU4.**

Lee Pivonka specified that a point of compliance (POC) needed to be established for the post-closure requirements. It was agreed that the boundary of the POC would be based on any or all of the following:

1) The IHSS boundary
2) The area of the original ponds

3) Ten feet past the engineered cover's surface water collection system, and/or the IHSS boundary.

Harlen Ainscough specified that the boundary of the Corrective Action Management Unit (CAMU) needed to be defined. He specified that the CAMU concept was based on material management as opposed to a region of contiguous contamination. The CAMU area does not have to be the same as the OU4 boundary to consolidate media outside of the CAMU area to within the CAMU. The promulgate CAMU concept is specified in the February 16, 1993 *Federal Register*, and is different from the original CAMU concept proposed in 40 CFR Subpart S. Harlen Ainscough will meet with ES to discuss the details concerning applying for a CAMU.

7) Open Issues

It was agreed that the roundtable review period was very tight, and that all team parties would provide a good faith effort to comply with the schedule. Andy Ledford specified that the last day for comments was March 23, 1994.

The following number of copies will be distributed:

EPA	-	4
CDH	-	2
EG&G	-	9
DOE	-	7
ERM/G&M	-	3

		25

Philip Nixon, Project Manager

Attachment 1
SP307-020394-01
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OPERABLE UNIT 4/SOLAR EVAPORATION PONDS

FEBRUARY 8, 1994

AGENDA

MEETING MINUTES RESOLUTION	8:00-8:30
VADOSE ZONE/GROUND WATER MODELLING-ES	8:30-9:30
METHODOLOGY	
RESULTS	
BREAK	9:30-9:45
DEFINITION OF VADOSE ZONE	9:45-11:00
ASPHALT VS. CLAY LAYERS	11:00-11:30

BLDG. 788

Attachment 2
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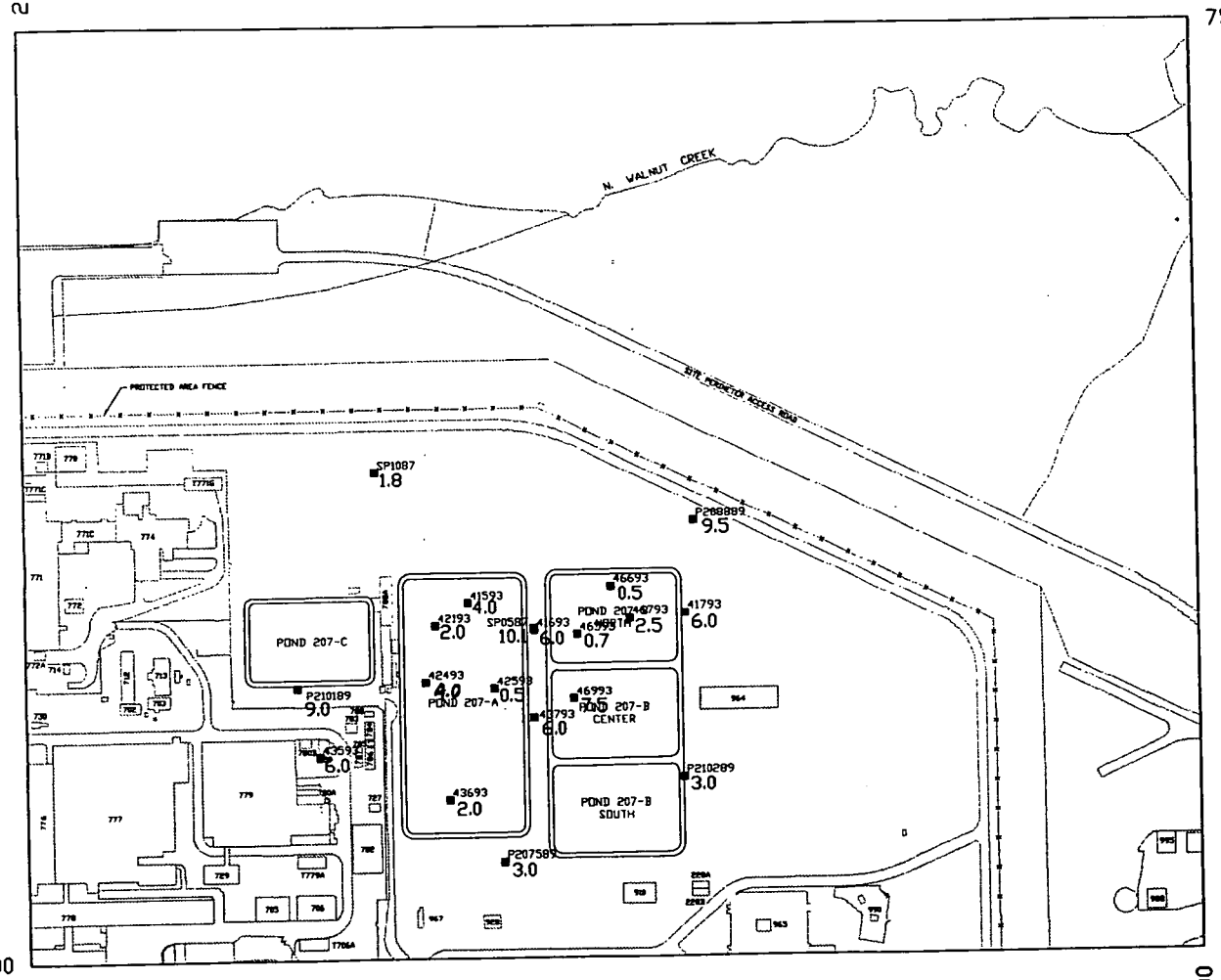

LOCATION	DEPTH	CHEMICAL	RESULT	UNITS
SP0587	9.5-10.1'	Chromium	780.50	mg/kg
SP1087	0-1.8'	Plutonium-239/240	3.50	pCi/g
P207589	0-3'	Mercury	10.80	mg/kg
P208889	3.5-9.5'	Barium	11600.00	mg/kg
P210189	3-9'	Uranium-235	0.30	pCi/g
P210289	0-3'	Plutonium-239/240	2.50	pCi/g
41593	0.4-0.5'	Americium-241	3.30	pCi/g
	0.4-0.5'	Plutonium-239/240	14.00	pCi/g
	0.4-0.5'	Uranium-235	0.29	pCi/g
	0.5-2'	Uranium-235	0.59	pCi/g
	2-4'	Uranium-235	0.30	pCi/g
41693	0-6'	Americium-241	2.70	pCi/g
	0-6'	Plutonium-239/240	3.00	pCi/g
	0-6'	Uranium-235	0.39	pCi/g
41793	0-6'	Americium-241	2.10	pCi/g
	0-6'	Plutonium-239/240	2.90	pCi/g
42193	0-2'	Uranium-235	0.87	pCi/g
42493	0.5-0.6'	Americium-241	4.90	pCi/g
	0.6-2'	Uranium-235	0.29	pCi/g
	0.6-2'	Cadmium	360.00	mg/kg
	2-4'	Cadmium	550.00	mg/kg
42593	0.4-0.5'	Plutonium-239/240	2.55	pCi/g
43593	1-6'	Americium-241	4.00	pCi/g
	1-6'	Plutonium-239/240	25.00	pCi/g
43693	0.4-0.5'	Americium-241	2.17	pCi/g
	0.4-0.5'	Plutonium-239/240	4.55	pCi/g
	0.5-2'	Americium-241	2.48	pCi/g
43793	0-6'	Americium-241	6.10	pCi/g
	0-6'	Plutonium-239/240	4.10	pCi/g
	0-6'	Uranium-235	0.54	pCi/g
46593	0.6-0.7'	Americium-241	2.78	pCi/g
	0.6-0.7'	Plutonium-239/240	19.80	pCi/g
	0.6-0.7'	Uranium-235	0.483	pCi/g
46693	0.33-0.5'	Americium-235	44.70	pCi/g
	0.33-0.5'	Plutonium-239/240	8.54	pCi/g
	0.33-0.5'	Uranium-235	1.69	pCi/g
46793	0.33-0.5'	Americium-241	11.70	pCi/g
	0.33-0.5'	Plutonium-239/240	12.90	pCi/g
	0.33-0.5'	Uranium-235	0.383	pCi/g
	0.5-2.5'	Uranium-235	0.3064	pCi/g
46993	0.9-1.3'	Uranium-235	0.399	pCi/g
	1.3-3.3'	Uranium-235	0.5193	pCi/g
	5.5-7.5'	Uranium-235	0.3832	pCi/g

Streams
Paved Roads
Buildings

46993 Borehole Location and Identification

7.5 Maximum Depth to Contamination (in feet)

100 0 100 200 300 FEET

PREPARED FOR
U.S. DEPARTMENT OF ENERGY
ROCKY FLATS PLANT
GOLDEN, COLORADO

Figure II.4-

OU4 Phase I RFI/RI
Extent of Contaminants of Concern in Subsurface Soils at Levels Greater Than Target Cleanup Levels

Contaminant of Concern (COC)	OU4 95% UCL (1)	OU4 95% UCL (2)	VLEACH Leachate (3)	Kd (4)	Kd Estimate (5)	Catastrophic Dissolution (6)	Comparison Criteria (7)
Radionuclides							
Americium-241	10.8 pCi/g	0.88 pCi/g	5.8E-11 - 4E-10 pCi/L	1200	9 pCi/L	1710 pCi/L	0.05 pCi/L
Plutonium-239/240	9.07 pCi/g	3.25 pCi/g	--	1500	6.05 pCi/L	1440 pCi/L	
Tritium	0.637 pCi/ml	7.55 pCi/ml	--	1	7	1.58 pCi/L	
Uranium-235	0.18 pCi/g	0.2 pCi/g	2.4E-11 - 8.4E-10 pCi/L	38	5.3 pCi/L	316 pCi/L	10 pCi/L
Metals							
Barium	--	160.1 mg/kg	0.00006 - 0.00018 g/L	128	1.2 g/L	0.25 g/L	0.001 g/L
Beryllium	1.4 mg/kg	--	9.8E-7 - 2.7E-6 g/L	128	0.01 g/L	0.022 g/L	4E-6 g/L
Cadmium	29.9 mg/kg	18.3 mg/kg	--			0.047 g/L	0.000005 g/L
Chromium	20.4 mg/kg	18.5 mg/kg	--			0.03 g/L	0.0001 g/L
Mercury	0.19 mg/kg	0.34 mg/kg	--			0.00054 g/L	0.000002 g/L
Nickel	13.4 mg/kg	--	--			0.02 g/L	
Volatile Organics							
1,1,1-trichloroethane	--	29 ug/kg	--	0.456	0.06 g/L	0.000046 g/L	
1,2-dichloropropane	--	29 ug/kg	--	0.153	0.19 g/L	0.000046 g/L	
2-hexanone	--	58 ug/kg	--	0.4047	0.14 g/L	0.000092 g/L	
Chloroethane	--	58 ug/kg	--	0.00972	5.97 g/L	0.000092 g/L	
Phenanthrene	301.66 ug/kg	330* ug/kg	--	1167.135	0.0003 g/L	0.0005 g/L	
Semi-volatile Organics							
1,4-dichlorobenzene	400 ug/kg	--	--	0.4755	0.84 g/L	0.0006 g/L	
2,6-dinitrotoluene	--	330* ug/kg	9.5E-7 - 9.5E-6 g/L	0.1848	1.78 g/L	0.0005 g/L	1.25E-7 g/L
Benzo(a)anthracene	187.77 ug/kg	330* ug/kg	--	4141.152	0.00008 g/L	0.0005 g/L	
Benzo(a)pyrene	212.78 ug/kg	330* ug/kg	--	5849.5338	0.00006 g/L	0.0005 g/L	
Benzo(b)fluoranthene	303.61 ug/kg	330* ug/kg	--	1650	0.0002 g/L	0.0005 g/L	
Benzo(k)fluoranthene	351.11 ug/kg	330* ug/kg	--	1650	0.0002 g/L	0.0005 g/L	
Bis(2-ethylhexyl)phthalate	660.88 ug/kg	254.6 ug/kg	--	300	0.002 g/L	0.001 g/L	
Chrysene	212.83 ug/kg	--	--	736.4127	0.00029 g/L	0.00034 g/L	
Hexachlorobenzene	--	330* ug/kg	--	104.0211	0.003 g/L	0.0005 g/L	
Indeno(1,2,3-cd)pyrene	--	330* ug/kg	--	92708.8629	0.000004 g/L	0.0005 g/L	
N-nitrosodipropylamine	--	330* ug/kg	--	0.03069	10.8 g/L	0.0005 g/L	
Pentachlorophenol	--	1,600* ug/kg	4.6E-6 - 2.3E-5 g/L	2.736	0.585 g/L	0.0025 g/L	1E-6 g/L
Pesticides							
Arochlor-1254	11,900 ug/kg	--	--	42	0.28 g/L	0.019 g/L	

(1) Calculated 95% upper confidence limit for OU4 data for surficial soils

(2) Calculated 95% upper confidence limit for OU4 data for vadose zone soils

(3) Maximum modeled concentration of leachate for that specific analyte using most conservative input parameters (RCRA cover - no action)

(4) Estimated liquid/solid partition coefficients from literature values and/or calculated by Koc*foc for organics

(5) Estimated concentration in ground water using relationship Kd = Csorbed/Cliquid (using most conservative 95% UCL value); estimates concentration in interstitial pore water

(6) Estimated maximum concentration in ground water assuming instaneous dissolution of all soil contaminants into upper alluvial aquifer

(7) Comparison criteria derived from Colorado Primary Drinking Water Standards and Colorado and Federal Maximum Contaminant Levels (MCLs)

REVIEW DRAFT

Attachment 3
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HYDROGEOLOGIC CONDITIONS BENEATH POND 207-C

General Understanding

Projections Of Ground Water Levels Beneath Pond 207-C Is Based On Ground Water Data From 7 Wells, Piezometers, And A Neutron Access Tube Located Adjacent To The Pond On The North, West, and South Sides.

Engineering-Science's Present Understanding Of The Hydrogeologic Conditions Beneath Pond 207-C Indicates That They Are Complicated By The Presence Of A Sandstone Member Of The Arapahoe Formation Beneath The Rocky Flats Alluvium Beneath Pond 207-C and Possibly Pond 207-A.

The Sandstone Acts As An "Underdrain" Where Sandstone Is In Direct Contact With The Alluvium. This Causes A Steep South To North Potentiometric Gradient Beneath Pond 207-C

Ground Water Levels

Ground Water Is Present In **Both** The Rocky Flats Alluvium And The Arapahoe Formation Under Water Table Conditions.

Projected Minimum Depths To Ground Water Beneath Pond 207-C Liner Range Between About 4 and 8 Feet Along The Western and Southern Portions of Pond 207-C.

Projected Minimum Depth To Ground Water Along The Northern Edge of Pond 207-C Is Greater Than 20 Feet Based On An Estimate From One (1) Neutron Access Tube 40993. Water Appears To Not Be Present In The Alluvium In This Area.

The Minimum **Projected** Ground Water Depths Below Ground and The Pond 207-C Liner Are Shown On Table 1.

TABLE 1

PROJECTED GROUND WATER LEVELS BELOW POND 207-C

Location	Lithology	WaterDepth Below Ground (feet)	Water Depth Below Liner (feet)	Assumed Liner Elevation (ft msl)	Distance From Top of Berm (feet)	Relative Location Around Pond 207-C
41993	Bedrock Sandstone	8.2	6.5	5977	20	Northwest Corner
42393	Bedrock Sandstone	8.5	6.3	5978	20	Southwest Corner
P209189	Bedrock Sandstone	6.2	3.5	5978	ON	Southwest Corner
P210189	Bedrock Sandstone and Claystone	9.9	6.1	5977	10	South-Central Edge
2286	Alluvium	4.9	3.1	5977	45	South-Central Edge
42993	Alluvium Bedrock Sandstone and Claystone	8.5	6.7	5977	15	Southeast Corner
40993	Bedrock Sandstone and Claystone	> 25	> 20	5976	20	North-Central Edge
P209489	Bedrock Sandstone	23.4	23.0	5976	95	Northeast Corner Pond 207A

Attachment 4
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